REMARKS

The amendments set out above and the following remarks are believed responsive to the points raised by the Office Action dated October 3, 2003, and discussed during the interview with Examiner Kim on December 18, 2003. In view of the amendments set out above and the following remarks, reconsideration is respectfully requested.

As an initial point, Applicants' representative greatly appreciates the courtesy shown him by Examiner Kim, and further appreciate his/her careful consideration of the arguments presented during the interview.

The Pending Claims and Amendments

Claims 12, 53, 76-78, and 80-85 have been canceled, and claims 1-11, 13-52, 54-75, 79, and 86 remain pending. Claims 87-91 are added by this amendment.

Claims 1, 13-15, 29, 32, 37, 41, 43, 46, 50, 54-56, 74 and 75 have been amended, and claims 87-91 have been added, to describe the invention more clearly. No new matter has been added, the basis for the amended claim language may be found within the original specification, claims and drawings.

Independent claims 1, 29, 32, 43, 46, 50 and 74 are supported at, for example, page 6, line 33, through page 7, line 4, and page 7, lines 6-11. Independent claim 75 is supported by, for example, previously pending claim 78. Newly submitted independent claims 87-91 are supported by, for example, previously pending claims 16, 19-21 and 23.

Additionally, since it appears the Abstract from the International phase application did not carry over to the Patent Office's file, the Abstract is submitted herewith.

Entry of the above is respectfully requested.

At the interview, Applicants' attorney discussed the nature of the present invention and the disclosures of the cited references. The claims have been amended in the manner discussed at the interview, so as to more particularly set out Applicants' invention.

During the interview, Applicants submitted that since none of the cited references, e.g., U.S. Patent Nos. 4,601,828 to Gershoni, 5,151,189 to Hu et al., 5,407,581 to Onodera et al., and 5,707,741 to Hoenel et al., teach or suggest the claimed embodiments, there is nothing in the cited references that would lead one of ordinary skill to the claimed invention.

After Examiner Kim agreed such claims were patentably distinguishable over the cited art, Applicants proposed amending or replacing the existing claims as discussed during the interview. Examiner Kim agreed such claims would be allowable over this art.

Allowable Subject Matter

Applicants are pleased to note the Office Action indicates claims 16, 19-21, 23, 33 36-42, 44, 45, 47-49, and 86 are indicated to be allowable if rewritten in independent form including the limitations of the respective base claims and any intervening claims.

Previously pending claims 16, 19-21, and 23 have been rewritten in independent form and to include the limitations of the base and intervening claims, and are submitted herewith as independent claims 87-91

The Office Action

For convenience, the following remarks will address the rejections in the same order they were raised in the Office Action.

Claims 1-5, 11, 15, 17-18, 25-27, 29-32, 50-51, 58, 60-63, 65-71, 74-77 and 79 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,601,828 to Gershoni (hereinafter referred to as "Gershoni").

Claims 1-4, 10-11, 24, 26-28, 50-52, 66-71, 75-76 and 79 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,151,189 to Hu et al. (hereinafter referred to as "Hu et al.").

Claims 1-12, 15, 17-18, 22, 25-29, 31-32, 35, 43, 46, 50-53 and 61-83 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,407,581 to Onodera et al. (hereinafter referred to as "Onodera et al.").

Claims 13-14, 24, 34, 54-57, and 84-85 were rejected under 35 U.S.C. §103(a) as being unpatentable over Onodera et al. as applied to claims 12, 32, 52, and 80, and further in view of U.S. Patent No 5,780,616 to Fornasari et al. (hereinafter referred to as "Fornasari et al.").

Claim 59 was rejected under 35 U.S.C. §103(a) as being unpatentable over Gershoni as applied to claim 58, and further in view of U.S. Patent No 5,707,741 to Hoenel, et al. (hereinafter referred to as "Hoenel et al.").

Each of these rejections is separately and respectfully traversed.

As discussed during the interview, the "charge modifying agent" disclosed in Gershoni includes resins wherein the positively charged group (the quaternary ammonium group) is part of the polymer backbone (col. 12, lines 21-32) and thus does not result in pendant cationic groups "directly linked to the backbone through a polar spacer group by a single bond."

Gershoni also discloses a "charge modifying agent" wherein the "charged nitrogen atom forms part of a heterocyclic grouping, and is bonded through a methylene moiety to a

depending, reactive epoxide group" (col. 12, lines 3-18), (i.e., the nitrogen is bonded by four separate bonds) and thus does not result in pendant cationic groups "directly linked to the backbone through a polar spacer group by a single bond." The "secondary charge modifying agent" disclosed in Gershoni acts to "enhance binding of the primary charge agent to the substrate or the primary charge agent itself" (col. 12, lines 40-41) and, to accomplish this task, is "bonded to the microporous membrane by bonding to a portion of the epoxide substituents of the polymeric primary charge modifying agent" (col. 13, lines 7-10). In such a reaction, the epoxy groups attached to the quaternary nitrogen atoms of the "primary charge modifying agent" react with the amino groups of the "secondary charge modifying agent" resulting in chain extension and the formation of multiple bonds between the charge modifying agents. This does not result in pendant cationic groups "directly linked to the backbone through a polar spacer group by a single bond," rather, the cationic groups are linked by multiple bonds to separate portions of the backbone or form a part of the backbone itself. When the foregoing "secondary charge modifying agent" in Gershoni is used as the charge modifying agent it is "...bonded to the microporous membrane through an aliphatic polyepoxide crosslinking agent" (col. 13, lines 36-38). In such a reaction, the epoxy groups of the crosslinking agent react with the amino groups of the "secondary charge modifying agent" resulting in chain extension and crosslinking. This also does not result in pendant cationic groups "directly linked to the backbone through a polar spacer group by a single bond," rather, the cationic groups are linked by multiple bonds to separate portions of the backbone or form a part of the backbone itself. Furthermore, with respect to claim 75, there is no disclosure in Gershoni of using an acrylate.

Hu et al. discloses a "primary charge modifying agent" wherein the quaternary ammonium group is part of the polymer backbone (col. 4, lines 1-10), and thus does not result in pendant cationic groups "directly linked to the backbone through a polar spacer group by a single bond." The "secondary charge modifying agents" disclosed in Hu et al. contain cationic groups that are part of the polymer backbone (col. 4, lines 50-55), or that are linked to the backbone through a non-polar group (col. 4, lines 35-45), and, thus, are not pendant cationic groups "directly linked to the backbone through a polar spacer group by a single bond." Furthermore, with respect to claim 75, there is no disclosure in Hu et al. of using an acrylate.

There is no disclosure in Onodera et al. of crosslinking and it does not disclose or suggest "a positively charged microporous membrane comprising a porous substrate and a crosslinked coating that includes a backbone and pendant cationic groups." Furthermore, with respect to claim 75, there is no disclosure in Onodera et al. of using an acrylate.

With respect to the rejection of claims 13, 14, 24, 34, 54-57, 84, and 85 under 35 U.S.C. §103(a), the deficiencies of Onodera et al. have been summarized above and discussed during the interview. There is no teaching or suggestion in Fornasari et al. of a positively charged microporous membrane comprising a porous substrate and a crosslinked coating including a backbone and pendant cationic groups, wherein each pendant cationic group is directly linked to the backbone through a polar spacer group by a single bond. The fact that Fornasari et al. may teach that a cationic polymer is formed by introducing quaternary groups with 3-chloro-2-hydroxypropyl-N, N, N-trimethylammonium chloride which introduces hydroxypropyl to the treated polymer is of no import. Fornasari et al. fails to remedy the deficiencies of Onodera et al., and therefore, the combination also fails to render the present invention obvious.

Similarly, with respect to the rejection of claim 59 under 35 U.S.C. §103(a), the deficiencies of Gershoni have been discussed above, and are not remedied by Hoenel et al., and thus, the combination also fails to render the present invention obvious.

For the reasons set forth above, reconsideration of the rejections is respectfully requested.

Conclusion

It is believed this response summarizes all the issues discussed during the interview. In view of the amendment and remarks recited herein, the application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue.

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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